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On line Claims WPI

(54) An improved dry battery

(57) A dry battery with high efficiency having cathode (zinc plate) provided with winding folds or projections disposed on its inner surface to increase the cathode area and shorten the distance between anode and cathode, thus raising the electrolytic speed and enhancing current output.

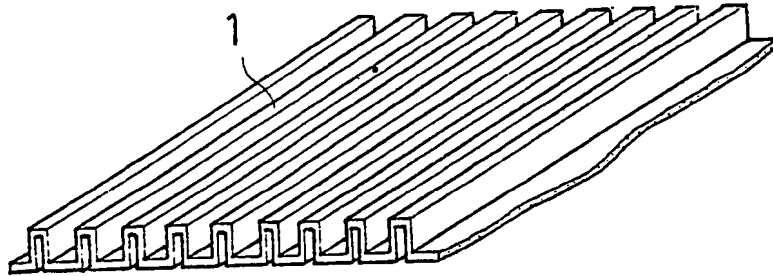
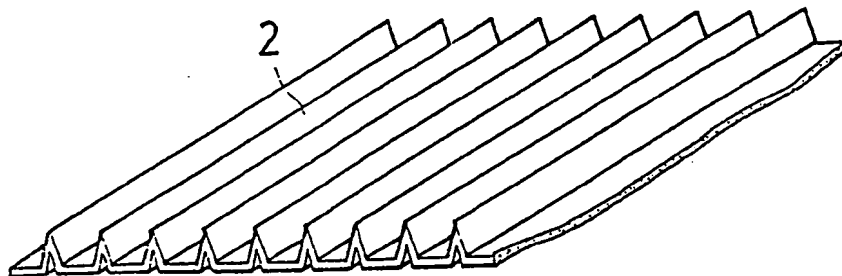


FIG. 1



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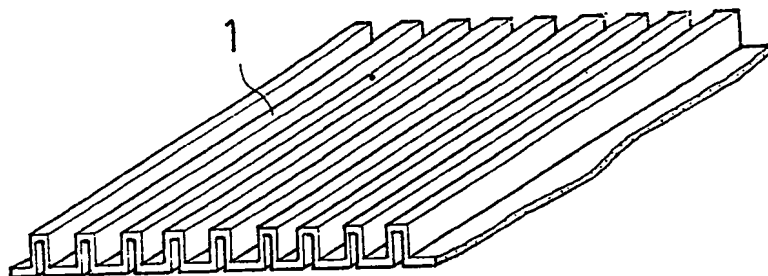


FIG. 1

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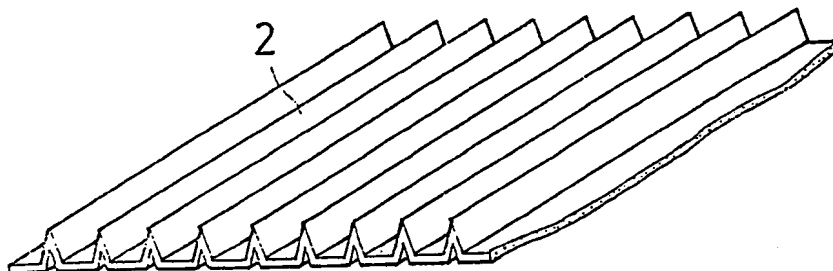


FIG. 2

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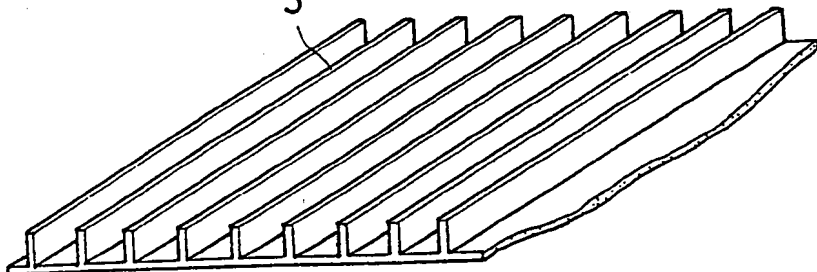


FIG. 3

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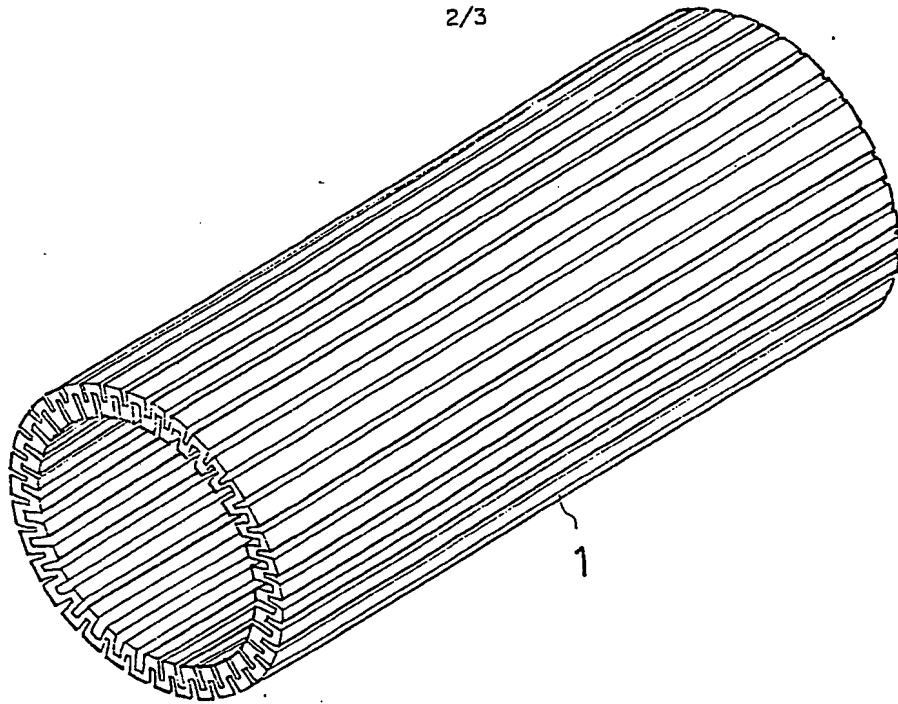


FIG. 4

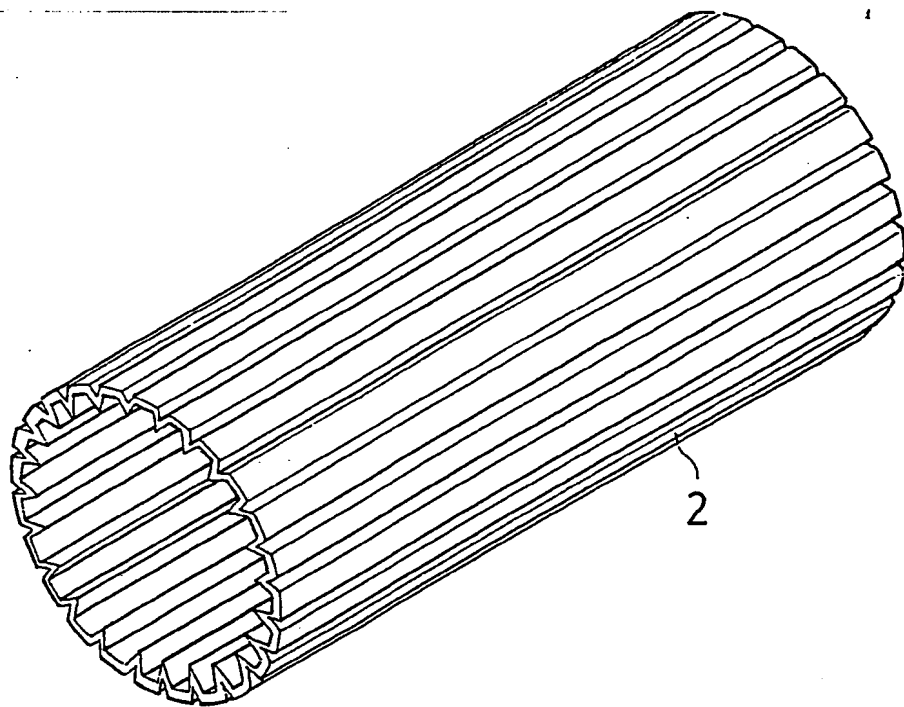


FIG. 5

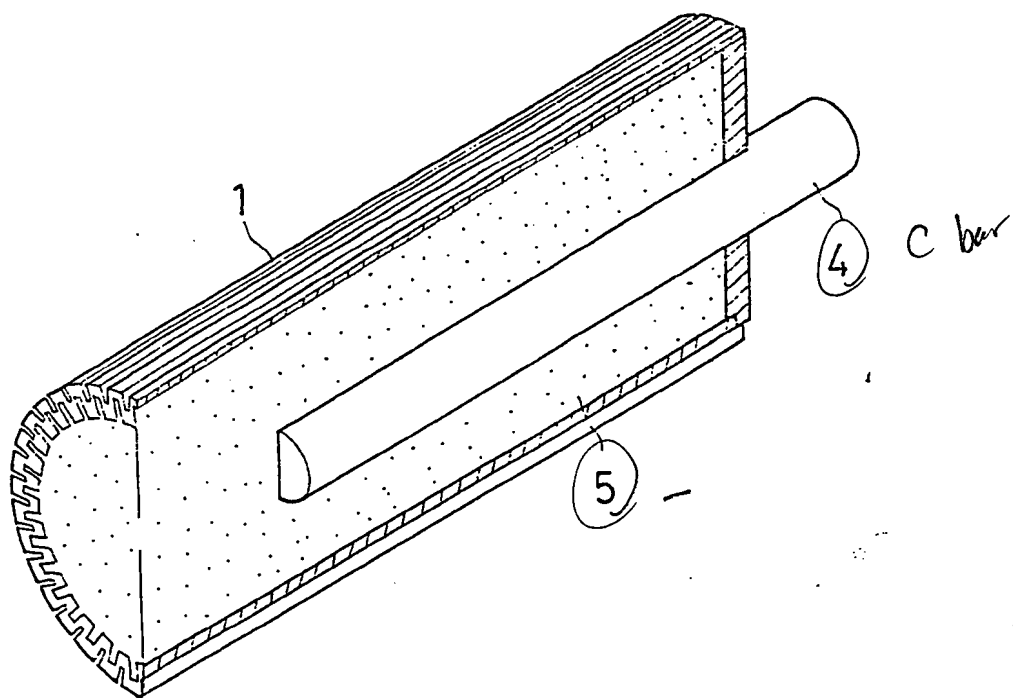


FIG. 6

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AN IMPROVED DRY BATTERY

The present invention relates to an improved dry battery or cell having a high efficiency.

5 Dry batteries are conventionally used in small electrical appliances or toys. Recently, the constructions and functions of such electrical appliances or toys have become more and more complicated and multiple known dry batteries are often needed to drive excessive parts or components thereof requiring greater load current. Although
10 dry batteries in series can produce required greater current, the volume of the electrical appliances or toys will be increased and thus affecting the original designs and appearance thereof.

15 It is therefore a primary object of the present invention to provide a dry battery having the same or similar volume to known batteries but having greater current output to satisfy the specific requirement which can not be met by the generally known dry battery.

20 According to the present invention there is provided a dry cell or battery with high efficiency, includes a cathode provided with undulations, winding folds or projections to increase the cathode area and shorten the
25 distance between anode and cathode and accordingly raise the speed of chemical reaction of the electrolyte and increase the current output.

30 The invention will be described further, by way of example, with reference to the accompanying drawings, in which :

Fig. 1 is a fragmentary perspective view of an electrode forming part of an embodiment of the present invention;

5 Fig. 2 is a fragmentary perspective view of an alternative electrode to form part of an alternative embodiment of the present invention;

10 Fig. 3 is a fragmentary perspective view of a still further alternative electrode forming an embodiment of the present invention;

Fig. 4 is a perspective view of a complete electrode shown in part in Fig. 1;

15 Fig. 5 is a perspective view of a complete electrode shown in part in Fig. 2; and

20 Fig. 6 is a partial perspective sectional view of a battery or cell according to an embodiment of the present invention utilising the electrode (cathode) of Fig. 4 and showing an inner carbon bar forming an anode and electrolytic solution or paste.

25 A common dry battery mainly comprises an anode (carbon bar), a cathode (zinc plate), and an electrolytic solution comprising acid, base, salt, etc. mixed in a solvent such as water.

30 The current is produced by a chemical reaction. The present dry battery with high efficiency is constructed in the same way as the known one except that its cathode (normally of zinc plate) is precedingly provided with inner or normally inwardly directed winding folds 1, 2 (as shown in Fig. 1 and Fig. 2) or inner or normally inwardly directed projections 3 (as shown in Fig. 3) and is in the
35 example of the embodiment formed as a cylinder as shown

in Figs. 4 and 5. The thus formed cathode electrode is then associated with carbon bar 4 forming the anode and electrolytic solution 5, preferably in paste form, to constitute the dry battery (as shown in Fig. 6) according to the embodiment of the invention.

Two advantages can be achieved through the aforesaid inner winding folds or projections, namely :-

(a) The surface area of cathodes (zinc plate) is increased; and

(b) The distance between anode (carbon bar) and cathode (zinc plate) is shortened.

These two advantages effectively enhance the chemical reaction of the positive and negative ions and also produce a larger current to solve or minimize the problems, such as slow reaction, existing in prior, know dry batteries (e.g. some seemingly exhausted dry batteries produce current again after several days storage as a result of slow diffusion of electrolyte.)

However, it is known that only temperature and discharge rate can influence the ampere-hour of the dry battery, thus, greater current must be created at the cost of shortened overall life. But the enlarged area of anode (zinc plate) of the present invention can nevertheless act to compensate this condition somewhat. Furthermore, it is the only object of the present invention to produce a greater current with same volume of dry battery.

The aforesaid embodiment is used for describing the objects, features and functions of the present invention;

any person skilled in the art may make some change and
modification without deviating from the spirit or scope
of the present invention defined in the attached claims.
For example an outer casing of steel, for example, may
be provided.

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CLAIMS

1. A dry cell or battery with high efficiency, includes
a cathode provided with undulations, winding folds or
projections to increase the cathode area and shorten the
distance between anode and cathode, and accordingly raise the
5 speed of chemical reaction of the electrolyte and increase
the current output.
2. A dry cell or battery as claimed in claim 1, in which
the folds or projections are formed as generally
10 U-shaped or V-shaped inwardly directed grooves or of
bar-like ribs.
3. A dry cell or battery substantially as herein described
with reference to the Fig. 6 possibly modified according
15 to the electrode configurations of Figs. 2 or 3.
4. An electrode for use in a dry cell or battery
comprising a sheet or cylinder or other shaped component
having corrugations, grooves, channels or projections on the
20 side to normally face the other electrode.
5. An electrode substantially as herein described with
reference to Figs. 1 to 5 of the accompanying drawings.

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